Introduction to Seed

Definition

➤ ***From the botanical point of view,*** Seed is defined as fertilized, matured ovule consisting of an embryonic plant together with a store of food, all surrounded by a protective coat. e.g. Rice seed, wheat seed, jute seed etc.

➤ ***From the agricultural point of view,*** Any plant part either vegetative or reproductive which having the capacity to produce offspring of its own type is called agricultural seed. e.g. Sugarcane sett, potato tuber etc.

Or, Any part of plant is used for the propagation of its next generation is called seed.

➤ ***Philosophically,*** A Seed may be defined as the fruit yesterday and crop of tomorrow.

Distinguish between Botanical seed and agricultural seed

Botanical seed	Agricultural seed
1. Seed is defined as fertilized, matured ovule consisting of an embryonic plant together with a store of food, all surrounded by a protective coat.	1. Any plant part either vegetative or reproductive which having the capacity to produce offspring of its own type is called agricultural seed.
2. All kind of plant produce this type of seed.	2. Only phanerogamous plant produce such kind of seed.
3. All Botanical seed are agricultural seed.	3. All agricultural seed are not Botanical seed.
4. Only seeds are used for propagating materials. e.g. Rice seed, wheat seed etc.	4. Seeds as well as vegetative parts are used as propagating materials. e.g. Sugarcane sett, potato tuber etc.

Importance of seed

- **Seed supplies staple food:** Seeds are food for human and animal and other living beings. Globally 95% of the total food comes from seed. About of 250 species of seeds are used as food for human and animal being. The 6 species of seeds which are used for human consumption are giving as Rice, Barley, wheat, Oat, Maize, Rye etc. The principal kinds of food stored in the seed either inside the cotyledon or in the endosperm are given below-

a) *Carbohydrate:* Starch, hemicellulose, sugar.

b) Fat and oils.

c) protein.

d) mineral and vitamin.

- **Seed supplies raw materials to industries:** A number of Industrial Products may be extracted from seeds. i.e. mustard oil, coconut oil etc. comes from mustard and coconut seed or fruit.
- **Seeds are the basic commodity of agriculture:** Seeds are the only commodity enabling the people to work with increasing productivity in the field. Without it, the production of work would not be possible. Seeds are the main means of survival of the plant species. Hence, it is recognised the basic commodity.
- **Seeds are the vehicle of life or means of propagation:** Seeds are the vehicle for propagation of new life from one place to another. Many species of plants are widely spread because their seed is easily dispersed.
- **Seeds protect and sustain life:** Seeds carry present germplasm variously protected against heat, cold, drought and water. Seed contain reserved food for the development of embryo into a young plant. When a seed germinates after a period of time, it develops to the full maturity and more seeds are produced.
- **Seeds are used as medicinal purpose:** In some cases, seeds and their products are good source of medicine. Their medicinal value has been widely recognised such as alkaloid and other compounds. Quinine is the most effective remedy from malariae is extracted from the seed of cinchona. One kind of medicine is produced from Jute seeds.
- **Seeds are the source of oil supply:** Seeds are the main source of vegetable oils. Supplying about 55% of the total oil from seed.
- **Seeds act as a national treasury:** Seeds are the national asset and may be compared with currency of a country. It is a source by which the foreign currency can be earned by exporting tea, jute etc.
- **Industrial by-product:** Some Industrial by-products are obtained from the industries which uses the seeds as the raw materials. In the rice mill and flour mill, husk and wheat bran are obtained as their by-products and used as animal food and also the organic manure.
- Seed increases the goodwill and friendship between the nations.
- Seeds are used as a main tools for the improvement of the crops.
- Seeds are used as beverages.
- Seeds are the used to prepare different types of Cosmetic. e.g. chain, vanity bag, ring etc.
- Seeds are means of fashion.

Classification of seeds

A. On the basis of **cotyledon;**

1. **Monocotyledonous seed:** Seed contain one cotyledon. e.g. Rice seed, wheat seed, maize seed etc.
2. **Dicotyledonous seed:** Seed contain two cotyledon. e.g. Gram seed, pea seed, potato seed, tomato seed, mango seed, jackfruit seed etc.
3. **Polycotyledonous seed:** seeds contain more than two cotyledons. e.g. Durba seed, pine seed etc.

B. On the basis of **endosperm content;**

1. **Endospermic seed:** The seed contain endosperm. This is also called albuminous seed. e.g. Rice seed, wheat seed, groundnut seed etc.
2. **Non-endospermic seed:** The seed doesn't contain any endosperm. This is also called exalbuminous seed. e.g. Gram seed, pea seed, tamarind seed etc.

C. On the basis of **embryo;**

1. **Mono-embryonic seed:** Only one embryo present in the seed. e.g. Rice seed, wheat seed, maize seed etc.
2. **Poly-embryonic seed:** More than one embryo present in the seed. e.g. citrus seed.

D. On the basis of **germination;**

1. **Hypogeal germination seed:** With this type of seed during germination, the cotyledon or cotyledons remain inside the seed coat and never appear above the soil. e.g. Gram, pea, paddy etc.
2. **Epigeal germination seed:** With this type of seed during germination, cotyledon or cotyledons remain inside the seed coat but appear above the soil. e.g. Bean, gourd, castor oil seed etc.

E. On the basis of **structure;**

1. **Weight protected seed:** e.g. Tomato seed and some grass seed.
2. **Structure protected seed:** e.g. Rice seed, Alfalfa seed etc.
3. **Loose filled seed:** e.g. Cotton seed, sunflower seed etc.
4. **Naked fruit seed:** e.g. Rice seed, wheat seed, maize seed etc.
5. **Naked seed:** e.g. Sorghum seed, cowpea seed, pea seed, bean seed etc.

F. On the basis of **Fertilization;**

1. **Fertilized seed:** e.g. Rice, wheat, gram etc.
2. **Unfertilized seed:** e.g. Citrus fruit, apple etc.

G. On the basis of **Longevity;**

1. **Microbiotic seed:** Life span < 3 years. e.g. Rubber, jackfruit, litchi, tea etc.
2. **Mesobiotic seed:** Longevity 3-15 years.
3. **Macrobiotic seed:** Longevity > 16 years. e.g. *Cassia bicapsularis*.

H. On the basis of **Desiccation tolerance;**

1. **Orthodox seed:** seeds that can retain viability after normal drying to lower seed moisture content i.e. have the capacity to tolerate desiccation. e.g. Rice, wheat, maize etc.
2. **Recalcitrant seed:** Seed that lose viability after drying to low moisture content i.e. can't tolerate desiccation. e.g. Litchi, mango, tea, coffee etc.

I. On the basis of **use,** seeds are classified into following;

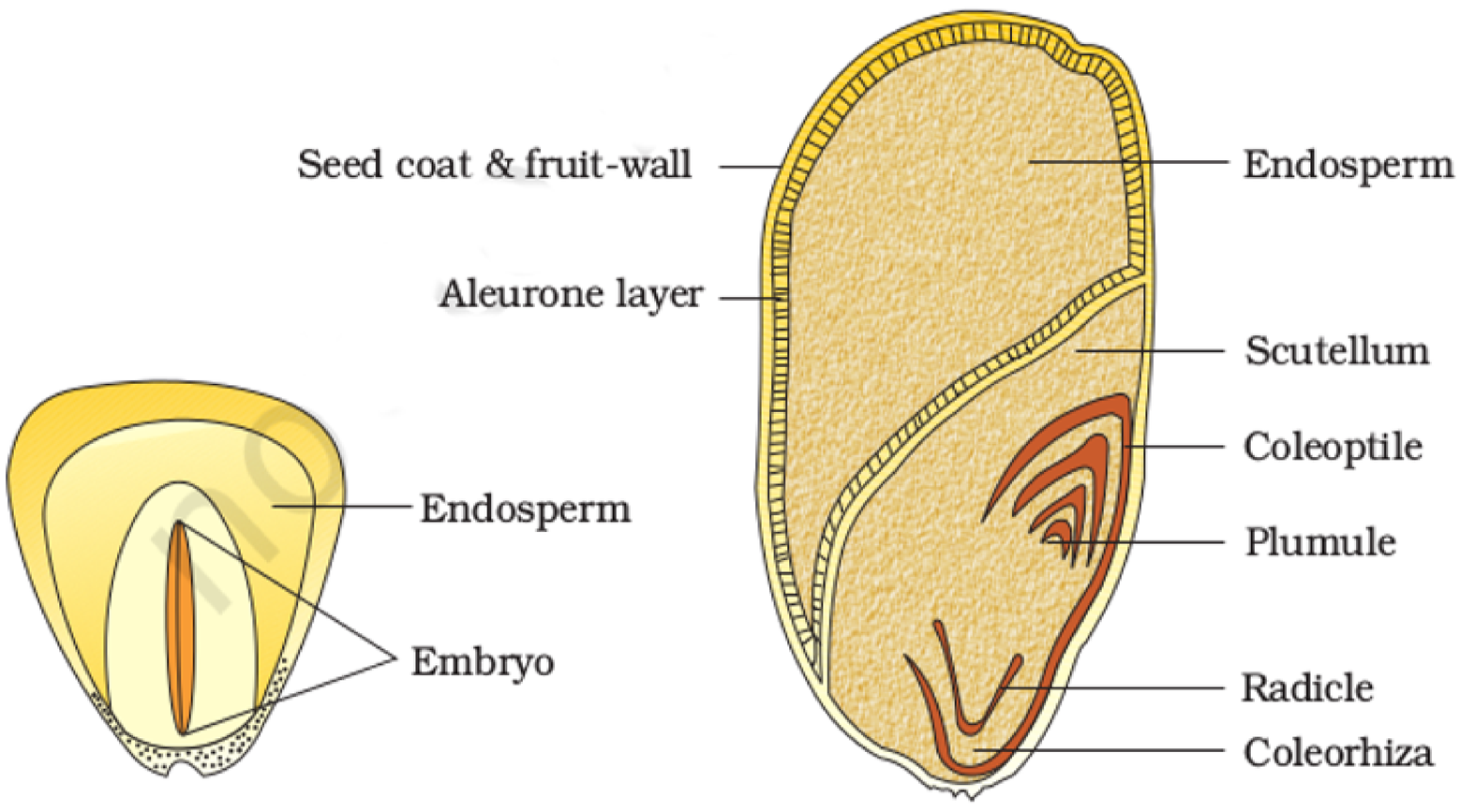
1. **Agricultural seed:** e.g. Sugarcane sett, potato tuber etc.
2. **Botanical seed:** e.g. Rice, wheat, maize etc.

J. On the basis of **propagating materials;**

1. **Stem cutting:** Sugarcane, sweet potato etc.
2. **Rhizome:** Ginger, turmeric etc.
3. **Tuber:** Potato.
4. **Bulb:** Onion, garlic etc.
5. **Corm:** Taro, yam etc.
6. **Tuberous root:** Sweet potato.
7. **Sucker:** Banana.
8. **Root cutting:** wood apple, guava etc.
9. **Leaf:** Patharkuchi.
10. **Bulbil:** Gach alu.

Seed structure

■ Different parts of a monocot seeds



Structure of a monocotyledonous seed

1) Seed coat or fruit wall.

2) Embryo.

   i. Cotyledons or scutellum.

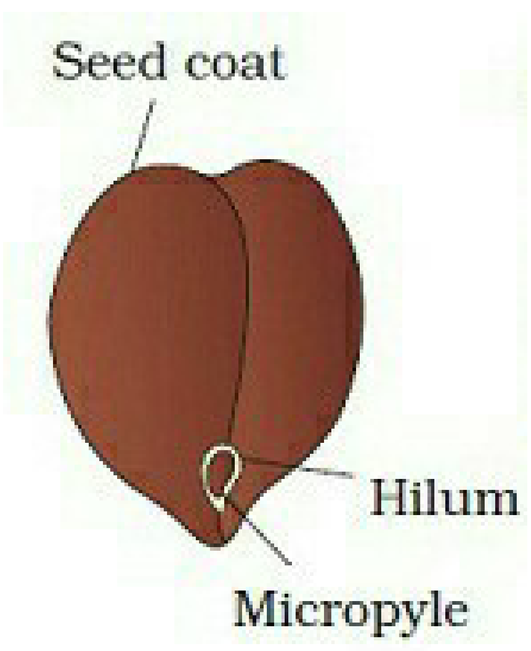
   ii. Epicotyl or plumule.

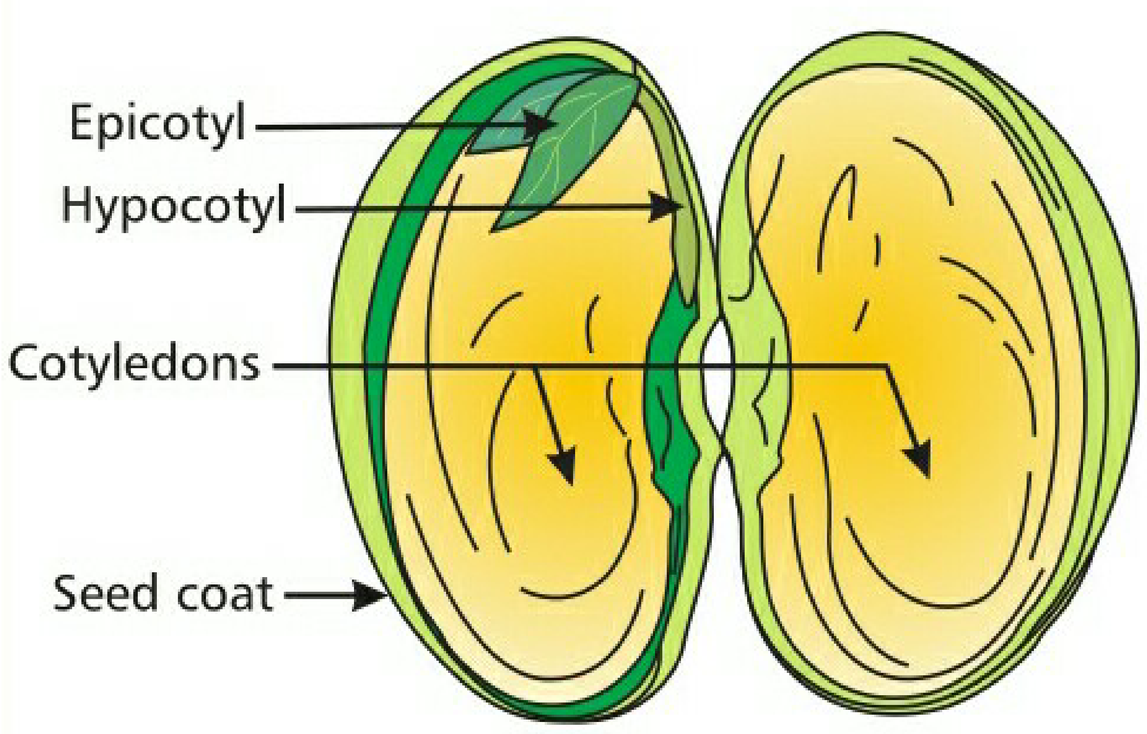
   iii. Seminal root.

   iv. Hypocotyl or radicle.

3) Endosperm.

■ **Different parts of a dicot seeds**





1) Seed coat.
2) Raphe.
3) Micropyle.
4) Hilum.
5) Embryo
    - ★ Cotyledon
        - ◆ Epicotyl.
        - ◆ Hypocotyl.
    - ★ Embryonal axis.

Mahbubul Alam

CST-06, Faculty of Agriculture

University of Rajshahi